

Food contamination info sheet #1

Salmonella in spices

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National ([New York Times](#), [MSN](#), and others) and local media ([KCUR](#), and I saw it on a Kansas City TV station) have recently been carrying stories about the risk of *Salmonella* in spices. These articles were prompted by an [FDA study](#) published in June 2013 in the reputable scientific journal *Food Microbiology*. While there have been no recent illnesses definitively linked to this food- pathogen combination, consumers may be concerned about the safety of their spices because of the media coverage.

Contamination info:

The US imports more than 80% of its spices, most of which are grown in tropical countries, where producers and handlers may face difficulties in controlling contamination with pathogens such as *Salmonella*. However, efforts are underway in spice growing and exporting areas to improve their production, handling, and transportation practices to reduce the incidence of spice contamination.

There have been some incidents in the past where *Salmonella*- contaminated spices resulted in foodborne illness including the following:

- 2007: [Puffed rice and corn snacks with a vegetable coating](#)- 69 people (93% were less than 3 years old) sick
- 2009: [Ground white pepper](#) – 87 cases, 1 death
- 2009- 2010: [Black and red pepper-coated Salami](#) - 272 people sick

FDA study on spice contamination:

This [FDA study](#) reported that the prevalence of *Salmonella* in imported spices from 2007-2009 was 6.6% (compared to 3% of all other imported FDA-regulated foods). However, when looking closer at the [FDA study](#), we can see the following:

- The spices were tested at the time of import into the US (rather than at the retail level). The majority of the spices tested were listed as NOT being pathogen treated or not known. Particularly with larger, more reputable spice companies, it is very likely that the spices were treated with a pathogen reduction measure after importation.
 - o It appears that even 3% of spices that were subjected to some sort of pathogen reduction treatment before import were contaminated with *Salmonella*. However, these spices may be re-treated for pathogen reduction before being sold at retail.
- We do not know the size of the spice companies that had their products tested: larger, more well-established spice companies typically have very strict supply chains and pathogen reduction measures to control pathogens such as *Salmonella*.

- We do not know the level of *Salmonella* in the spices, only that *Salmonella* is present. Healthy adults would typically need to ingest 1000- 10,000 *Salmonella* cells to become sick, but that number is generally reduced in the elderly, young, and immune-compromised people.

Specifics on contamination by spice type in FDA study:

- The spices tested which most often had *Salmonella*:
 - o Coriander (15%), oregano/basil (12%), and sesame seed (11%)
- Spices tested which were least likely to have *Salmonella*:
 - o White pepper (1%), cinnamon/clove/nutmeg (1%), fennel/fenugreek/mustard (2.7%)
- *Salmonella* prevalence was higher for shipments of ground/cracked capsicum and coriander than for shipments of their whole spice counterparts.
- No difference in prevalence was observed between shipments of spice blends and non-blended spices.

Please note that this is just one study- other studies may have different results. Also, as with most studies, there is some statistical variation in the results (more info can be found in the study itself).

What to tell consumers:

- This data is for spices at the time of import. More research is needed to determine the level of *Salmonella* in spices at the retail level, which would provide better information on the spices that consumers actually buy and will use. This would also provide more information on the effectiveness of post-import risk management practices utilized by spice companies and regulators.
- Due to the reasons stated above, we cannot definitively conclude from this FDA study that there is a large risk of getting sick from *Salmonella* from consumption of spices (although we know there is some risk). Further, this is only 1 study, so further research should be done to be able to have more complete information from which to make conclusions and recommendations.
- What can consumers do if they are concerned about *Salmonella* in spices:
 - o You can lower your risk through buying spices from reputable sources/ brand names as these companies want to protect their brand name and thus have extensive food safety systems in place to minimize the food safety risk.
 - o Add spices to dishes before they are cooked, so that the spices will also reach the critical temperature for killing *Salmonella* (160F)
 - o Follow spice storage recommendations (ground spices: 6 months, whole spices: 1-2 years in airtight containers in dry places: http://nchfp.uga.edu/how/store/ksu_cupboard.pdf)

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